

Successful Implementation of a Behavioral Safety Program at Los Alamos National Laboratory

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Los Alamos National Laboratory

- **One of the original United States nuclear weapons complex laboratories**
- **Dates back to Project Y of the Manhattan Engineering District during WWII**
- **Radioactive research conducted for half a century**

Nuclear Materials and Technology Division (NMT)

- **Responsible for the operation of the Plutonium Facility**
- **Responsible for a wide variety of actinide processing operations in support of the U.S. Department of Energy's stockpile stewardship of the U.S. nuclear arsenal**

TA-55



Chemistry Metallurgy and Research (CMR)



ATOMICS MISSION

- **The Vision of the ATOMICS is to become the Los Alamos National Laboratory and U.S. Department of Energy's model of excellence in the application of safety performance**
- **The ATOMICS Mission is to continuously improve the health and safety of the NMT Division workforce by reducing at-risk behaviors through ongoing behavioral observations**

Safety Improvement Mechanisms

- **Attitude Change**
- **Culture Change**
- **Behavior Change**

Attitude

- **Show me your attitude**
- **Attitude is invisible**
- **Attitude in Accidents and Injuries**
- **Attitude change mechanisms**



Culture

- **Culture is hard to define and slow to change**
- **Culture in Accidents and Injuries**
- **Culture change mechanisms**



Behavior

- Behaviors are easily observed
- Behaviors can be measured
- Behaviors can be managed
- Behaviors will affect attitudes and culture





Nuclear Materials and Technology

ATOMICS

The ATOMICS Behavior-Based Safety Process:

- **3rd year of implementation**
- **~ 5,000 peer to peer observations**
- **~ 650 trained observers**
- **Worker based-management supported**

4 Essentials Elements Of Behavior-Based Safety

- 1. Identify the critical behaviors**
- 2. Collect Data**
- 3. Provide Feedback**
- 4. Use data to reduce and/or remove barriers to safe work**



Behavior

- **Enabled Behavior**

A behavior the employee has direct control over

- **Difficult Behavior**

Behaviors the employee can do, but the business system of the organization is not conducive to performing them

- **Non-enabled Behavior**

A situation where the risk is “baked into” the system and the employee is powerless to change it



Behavior-based Safety Foundational Concept

Consequences

Control

Behavior

3 Factors that affect the power of consequences

- **Timing:** **Sooner / Later**
- **Consistency:** **Certain / Uncertain**
- **Significance:** **Positive / Negative**

Observation Feedback

**Feedback is a direct consequence of an
observation**

To be effective, the feedback must be:

Soon,

Certain, and

Positive



Process Success

- **> 12000 employees have participated in the process**
- **> 650 individuals have been trained as observers**
- **Process has survived four Division Director changes**
- **Action plans distributed and acted upon**

Observation Success

- While employee was moving furniture, employee was at risk for back/shoulder strain from awkward position lifting and bending. Employee said, “ I need to get this done today and don't have any help.”
- While employee was opening a jar labeled only "Chem-Etch," employee was at risk for not knowing the chemical content because it had no Haz-Com label. Employee said, "This is potassium nitrate in water. I didn't think it was hazardous but I will put a Haz-Com label on it."

Observation Success

- **Worker at risk for electrocution while working on electrical with circuit breaker in off position but not locked out. Worker stated supervisor told worker no energy source was present. Worker thought that meant circuit locked and tagged out. This is the first time worker has used LOTO. Also worker forgot that their lock must be used while working on the system. Observer assisted with LOTO procedure.**

Identify & Remove Barriers

Types of Barriers:

- Hazard Recognition and Response
- Business Systems
- Rewards/Recognition
- Facilities and Equipment
- Disagreement on Safe Practices
- Personal Factors
- Culture
- Personal Choice

Action Planning from Data

Observation Comment:	Location:PF-4
<p>While employee was opening a very heavy outer airlock door at PF-4 entrance, employee had to overcome ~5/8 inch play in the handle before the door would start opening. Employee at risk for ergonomic injury from poor body mechanics. Employee said, “The catch mechanism on this door needs adjustment.” This was reported to the safety office.</p>	
<p>While employee was opening air-lock door, employee was at risk for arm, neck, shoulder injury. Employee said, “Door is so heavy that I hurt my shoulders every time I open it.” Opening the door requires people to lean into door instead of being able to stand up straight and open it.</p>	
<p>While employee was opening the outer air-lock door to outer PF-4, the employee grimaced and strained to open door. The employee said, “This door needs help. I’m too small for it.” The employee was at risk for strain or pinch if the door closed on arm.</p>	

Action Planning from Data

Problem Statement:
04/2003

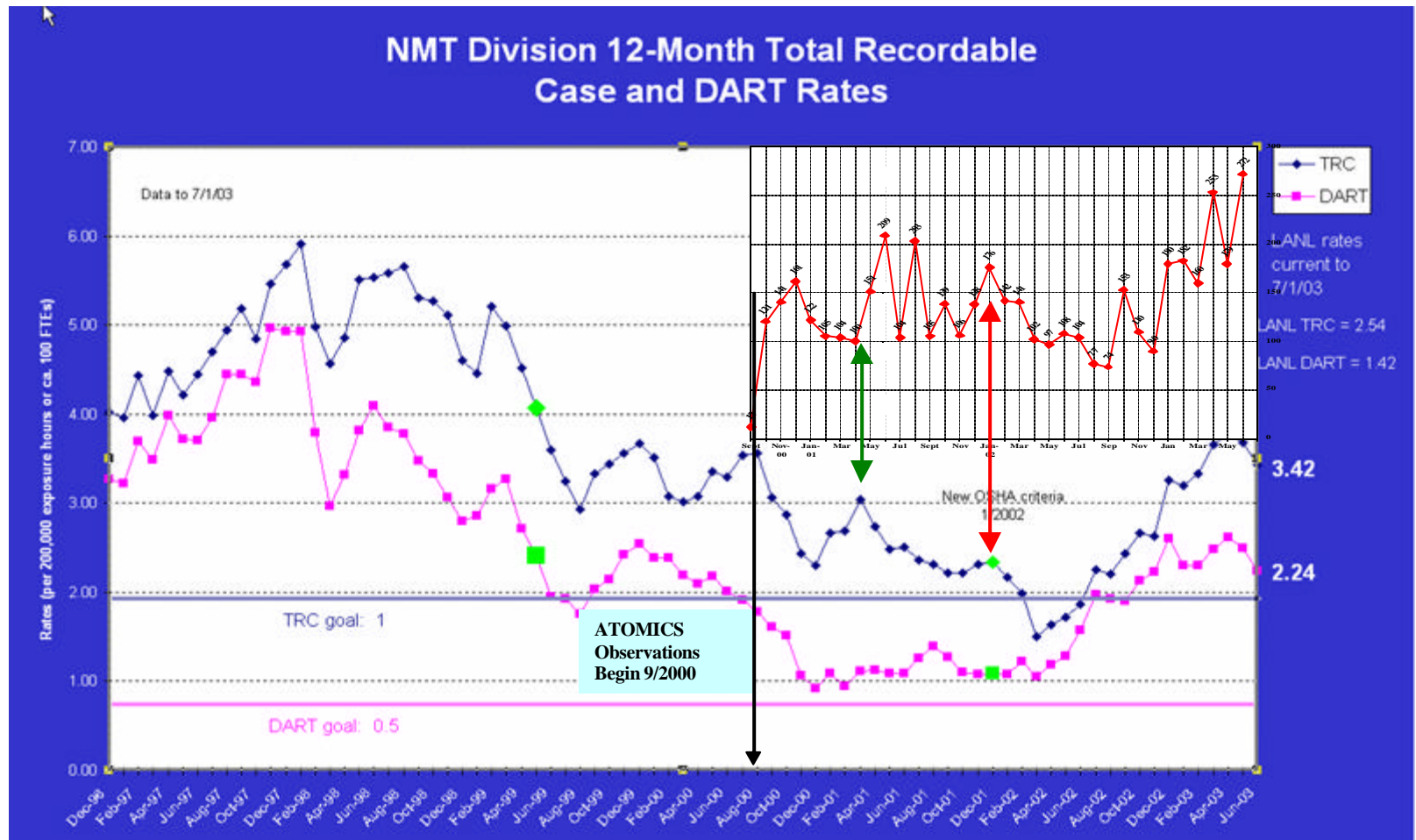
Action Plan ID # 01-

Workers have been observed having a very difficult time entering airlock doors because of the negative air requirements. Employees perform this activity on a very frequent basis and the level of risk and consequences are considered high for an accident. There has been one injured employee this year.

Action Planning from Data

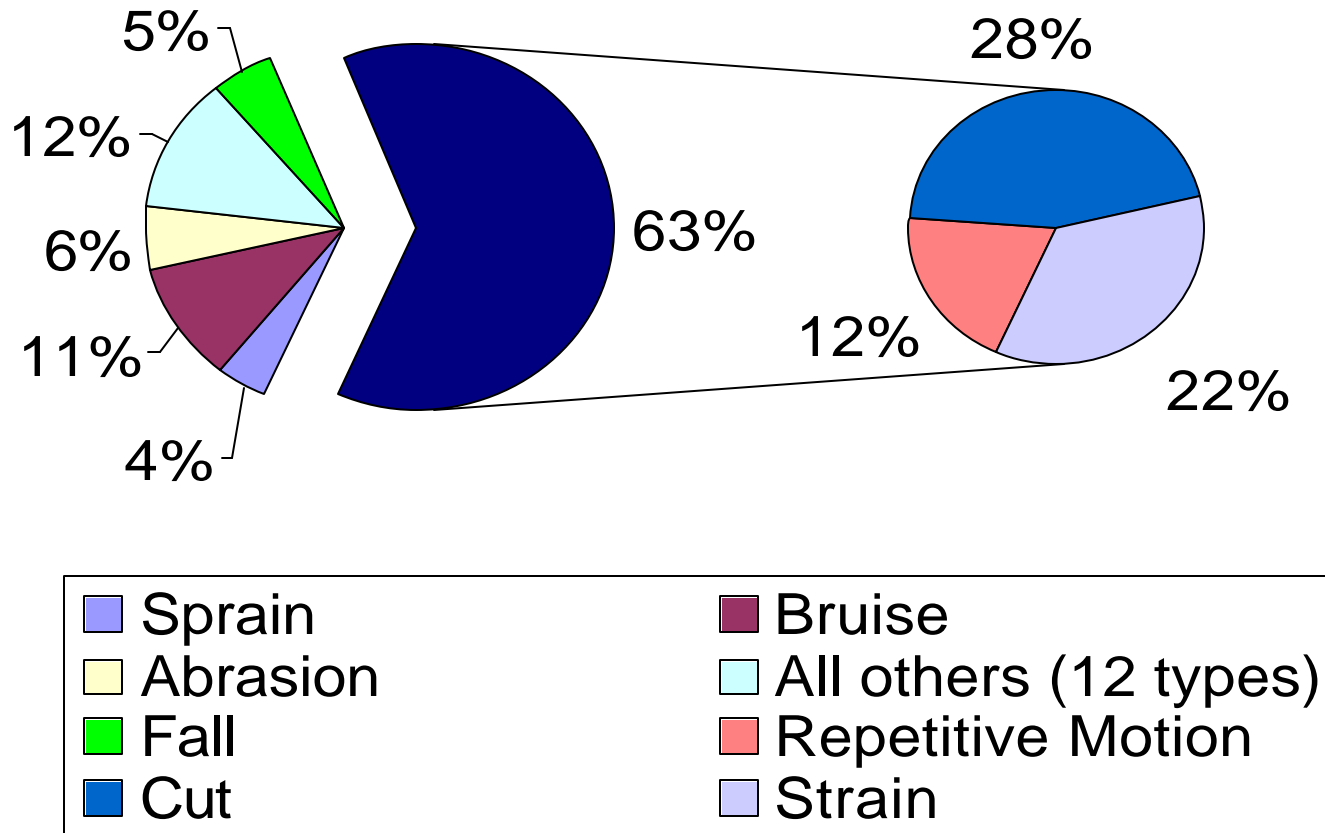
What: (Describe the specific behavior the person responsible will do)	By Whom?	By When?	Date Completed
<p>Request Area Work Controller view the activity and access the feasibility of repairing the play in the handle</p> <p><i>A meeting with Jim Fraser, Terry Morison (acting AWC team leader) and Curtis Emms was held on 04/09/03 and FWO will be taking a look at the problem and then let us know what can be done on the door. It seems that the door handle has no direct impact on the problem.</i></p>	Curtis Emms	04/17/03	04/09/03
Contact NMT Health and Safety Team for an evaluation of the level of pull needed to open airlock doors.	Tom McNaughton	04/24/03	
Accumulate additional observational data for one month and access the actions above for increased percent safe.	All	05/17/04	
<p>Consider the feasibility of installing pneumatic assists to allow workers entering the airlock a safer pass.</p> <p>(If it can be done, get done by 07/01/03)</p>	Mark Rivera		

Total Recordable Case Rate (TRC) and Days Away Restricted or Transferred Date (DART)



Data Determines the Focus for Observations

Injuries by Type (Last Two Years)



ATOMICS Data To-Date

Date	% Safe Behaviors Observed	Observations Performed	Employees Observed
• September 2000 – September 2001	91.90	1,533	2,073
• September 2001 – September 2002	93.84	1,440	2,187
• September 2002 – September 2003	94.74	1,833	2,970
		<u>4,806</u>	<u>7,230</u>

ATOMICS has documented the active participation of >12,000 NMT employees in this safety process